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Scientific Uncertainty and the National Environmental Policy Act—The Council on Environmental Quality's Regulation 40 C.F.R. Section 1502.22

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SCIENTIFIC UNCERTAINTY AND THE NATIONAL ENVIRONMENTAL POLICY ACT—THE COUNCIL ON ENVIRONMENTAL QUALITY'S REGULATION 40 C.F.R. Section 1502.22

The National Environmental Policy Act (NEPA)[1] requires federal agencies to prepare Environmental Impact Statements (EIS's) for all major actions significantly affecting the environment.[2] The EIS must disclose and evaluate alternative actions and their environmental consequences.[3] Congress did not address the problem of scientific uncertainty when it passed NEPA.[4] Ten years later, the Council on Environmental Quality (CEQ) tackled the issue by including section 1502.22 in its new regulations governing EIS production.[5] The section provides that if scientific uncertainty exists but can be cured by further research the agency must do or commission the research. If the necessary research is exorbitantly expensive or beyond the state of the art the agency must make clear that the uncertainty exists and must also include a worst case analysis in its EIS.[6]

For several years this regulation was virtually overlooked by the agencies and was not the subject of litigation. Recently, however, plaintiffs have discovered it and used it to block agency action when an agency overlooked or only paid lip service to the regulation's mandate. The contours of the regulation are still hazy. Four recent federal appellate court cases have begun shaping the regulation's interpretation, but several issues remain unanswered. This Comment analyzes both the scope of the regulation and the role courts should play in enforcing and clarifying it.

After a brief background discussion the Comment addresses the regulation's information gathering requirement. It suggests that this duty to

1. National Environmental Policy Act of 1969 [hereinafter cited as NEPA] §§ 101–209, Pub. L. No. 91-190, 83 Stat. 852 (codified at 42 U.S.C. §§ 4321–47 (1982)). The policy Congress adopted is set out in *id.* § 101, 42 U.S.C. § 4331:

> The Congress, recognizing the profound impact of man's activity on the interrelations of all components of the natural environment . . . and recognizing further the critical importance of restoring and maintaining environmental quality to the overall welfare and development of man, declares that it is the continuing policy of the Federal Government . . . to use all practicable means and measures . . . to create and maintain conditions under which man and nature can exist in productive harmony, and fulfill the social, economic, and other requirements of present and future generations of Americans.

2. *Id.* § 102, 42 U.S.C. § 4332.

3. The actual EIS requirements NEPA places on federal agencies are found in *id.*.

4. Note, *Putting Bite in NEPA's Bark; New Council on Environmental Quality Regulations for the Preparation of Environmental Impact Statements*, 13 U. MICH. J.L. REF. 367, 384 (1980) (NEPA "completely overlooks the possibility that potentially relevant information may be unavailable or cost-prohibitive.").

5. 40 C.F.R. §§ 1500–17 (1983).

6. *See infra* note 19.

perform or commission research encompasses all important information. Next it addresses the topic of what the worst case analysis should include. Finally it addresses the role of the courts in implementing the regulation as a whole. The Comment advocates hard look review. It concludes that such review may enhance the quality of agency decisions and accord fairness to those affected by agency action whenever scientific uncertainty admittedly exists.

I. BACKGROUND

In 1969, Congress created the CEQ to help agencies meet their responsibility of considering environmental values and effects in their decisionmaking.[7] CEQ's original power was quite limited.[8] In 1970, President Nixon expanded that power through Executive Order No. 11514,[9] which directed CEQ to issue procedural guidelines for agencies preparing EIS's.[10] CEQ did issue those guidelines[11] but adherence to them was spotty in both the agencies and the courts.[12] In 1977 President Carter amended Order No. 11514 with Executive Order No. 11991,[13] directing CEQ to promulgate binding regulations. CEQ complied, and its new regulations took effect on July 30, 1979.[14] The Supreme Court has declared CEQ's regulations to be binding on the agencies and entitled to "substantial deference" by the courts.[15] Such deference means the regulations will be enforced unless inconsistent with NEPA or its interpretation by the Supreme Court.[16]

The purpose of the regulations was to inform agencies on how to meet NEPA's procedural and substantive requirements. The regulations place

7. NEPA § 202, 42 U.S.C. § 4342 (1982). CEQ was created within the Executive Office of the President to review federal policies and make recommendations for change.

8. The specified functions of CEQ include gathering information, analyzing data, preparing reports, reviewing federal policy for NEPA compliance, and recommending policies to promote environmental quality. *Id.* § 204, 42 U.S.C. § 4344 (1982).

9. 3 C.F.R. 902 (1970), *amended by* Exec. Order No. 11,991, May 24, 1977, 3 C.F.R. 123 (1978).

10. 3 C.F.R. 902, 904 (1970).

11. 40 C.F.R. §§ 1500–17 (1973), *amended as* 40 C.F.R. §§ 1500–17 (1983).

12. *See* W. RODGERS, JR., ENVIRONMENTAL LAW 708 (1977) ("[S]ome courts entertain doubts on the statutory justification for the guidelines, calling them 'merely advisory,' while others apply them uncritically or insist they can be ignored only for the 'strongest reasons.'"); *see also* Stevens, *The Council on Environmental Quality's Guidelines and Their Influence on the National Environmental Policy Act*, 23 CATH. U.L. REV. 547, 551 (1974).

13. 3 C.F.R. 123 (1978).

14. 40 C.F.R. §§ 1500–15 (1983).

15. Andrus v. Sierra Club, 442 U.S. 347, 358 (1979).

16. Comment, *NEPA After* Andrus v. Sierra Club: *The Doctrine of Substantial Deference to the Regulations of the Council On Environmental Quality*, 66 VA. L. REV. 843, 846 (1980)

responsibility for enforcing NEPA equally on the President, the federal agencies, and the courts to achieve the substantive goal of environmental balance as set forth in section 101 of NEPA.[17] Section 1502 outlines the specific requirements for EIS preparation.[18] Subsection 1502.22, the subject of this Comment, sets forth requirements regarding incomplete or unavailable information.[19]

Under section 1502.22 the first duty of an agency that is unable to calculate with certainty the impact of its planned action is to disclose that fact.[20] Following disclosure, an agency must gather missing information.[21] If the agency proves that it is impossible to gather such

17. 40 C.F.R. § 1500.1 (1983); *see supra* note 1 (NEPA § 101 policy statement).

18. 40 C.F.R. § 1502 (1983).

19. *Id.* § 1502.22. It provides that:

When an agency is evaluating significant adverse effects on the human environment in an environmental impact statement and there are gaps in relevant information or scientific uncertainty, the agency shall always make clear that such information is lacking or that uncertainty exists.

(a) If the information relevant to adverse impacts is essential to a reasoned choice among alternatives and is not known and the overall costs of obtaining it are not exorbitant, the agency shall include the information in the environmental impact statement.

(b) If (1) the information relevant to adverse impacts is essential to a reasoned choice among alternatives and is not known and the overall costs of obtaining it are exorbitant or (2) the information relevant to adverse impacts is important to the decision and the means to obtain it are not known (e.g., the means for obtaining it are beyond the state of the art) the agency shall weigh the need for the action against the risk and severity of possible adverse impacts were the action to proceed in the face of uncertainty. If the agency proceeds, it shall include a worst case analysis and an indication of the probability or improbability of its occurrence.

20. Disclosure is predicated on the existence of "scientific uncertainty." *See id.* The closest approximation to a definition of scientific uncertainty that can be gleaned from the cases indicates that the term includes credible scientific disagreement among the experts. An agency's admission of uncertainty will, of course, suffice. Southern Oregon Citizens Against Toxic Spraying v. Clark *(SOCATS)*, 720 F.2d 1475, 1477 (9th Cir. 1983). In Save Our Ecosystems v. Clark *(SOE)*, No. 83-3908, slip op. at 448 (9th Cir. Jan. 27, 1984), disagreement between environmentalists and BLM scientists over the long term carcinogenaity of herbicides gave rise to scientific uncertainty as well.

It is probably necessary for courts to recognize only disagreements among experts, to keep the lone crackpot from gaining undue power to harrass the agency. Courts have the ability to judge the expertise and believability of scientists. For example, in Warm Springs Dam Task Force v. Gribble, 621 F.2d 1017, 1025 (9th Cir. 1980), the opinion of one geologist was enough to cast doubt on previous studies of possible dam failure and require the gathering of supplemental information.

While the regulation is explicit in requiring disclosure, it is silent on when, how, and to whom it must be made. A reasonable assumption is that disclosure must be made in any draft environmental assessments and draft impact statements. Circulating the disclosure at a time best suited to elicit public comment and to perhaps trigger the submission of the missing data from outside sources makes sense. As the *SOCATS* case makes clear, the regulation and the worst case analysis it may call for apply to environmental statements and assessments, before an agency makes a decision. 720 F.2d at 1481.

21. NEPA dictates that an agency gathering information must utilize a "systematic, interdisciplinary approach," must include "methods . . . which will insure that presently unquantified environmental values may be given appropriate consideration," and must include with its decision a "detailed statement" or EIS of the alternatives to and the effects of the proposed action. NEPA § 102, 42 U.S.C. x4332 (1982). One court has interpreted NEPA to require that agencies gather enough infor-

information,[22] it can proceed with the proposed action only after first weighing the need to proceed against possible risks,[23] and then preparing and including in its EIS a worst case analysis.

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mation "to enable the decisionmaker to consider the environmental factors and make a reasoned decision." Westside Property Owners v. Schlesinger, 597 F.2d 1214, 1217 (9th Cir. 1979).

Uncertainty hampers the goal of reasoned decisionmaking by forcing guesswork. Before the adoption of the CEQ regulations courts interpreted NEPA to require some gathering of information in cases of uncertainty, but the very lack of specificity in the requirement led to discrepancies in its enforcement. Thus in some instances courts were willing to allow missing information to be gathered after a decision to proceed was reached, County of Suffolk v. Secretary of the Interior, 562 F.2d 1368 (2d Cir. 1977), *cert. denied*, 434 U.S. 1064 (1978); Sierra Club v. Morton, 510 F.2d 813 (5th Cir. 1975), or to let the agency proceed even though potentially important information was lacking. Alaska v. Andrus, 580 F.2d 465 (D.C. Cir.), *vacated in part sub nom.* Western Oil & Gas Assoc. v. Alaska, 439 U.S. 922 (1978); Environmental Defense Fund v. Costle, 439 F. Supp. 980, 993 (E.D.N.Y. 1977).

A similar charge of uneven enforcement could be levelled against the court in Village of False Pass v. Clark, 733 F.2d 605 (9th Cir. 1984), decided after the CEQ regulations were promulgated, because the court did not require a worst case analysis concerning clearly uncertain consequences. That case dealt with lease sales, however, a preliminary stage in offshore oil development, and the court was careful to say that its decision not to require the gathering of information or the production of a worst case analysis was being made well before the irretrievable commitment of resources. *Id.* at 614. The dissent, relying on the specific requirements of the new regulation, thought that the information was necessary even at the lease sale stage. *Id.* at 617 (Canby, J., dissenting).

Section 1502.22(a) conforms to NEPA's general goal and the cases interpreting it, but is much more specific. The section now calls upon the agency in straightforward terms to get the missing information. One court interpreted the section to require site-specific research and original research by the agency. Oregon Envtl. Council v. Kunzman, 714 F.2d 901, 904 (9th Cir. 1983). Moreover, the decisions reveal that the more specific regulation has fostered greater court scrutiny of the agency duty to gather information. The best example of that close scrutiny is *SOE, No. 83-3908 (9th Cir. Jan. 27, 1984); see also infra* note 49 and accompanying text.

22. If the duty to gather information were made absolute, agency action in the face of uncertainty would often be effectively stopped. CEQ has instead made available a defense of impossibility to discharge the duty. If an agency can show either that the cost of getting information is exorbitant or that no known means exist to get it, it may proceed with the action by complying with section (b).

Courts have not established guidelines for when a cost may be considered exorbitant. Exorbitance should be interpreted in light of the usefulness of the missing information and the seriousness of the possible harm. For example, a costly study likely to establish the true risk to people posed by pesticide use should be less readily termed exorbitant than equally expensive but more speculative research into rather minor environmental risks.

The other prong of the impossibility defense is a state of the art defense. If the information is missing because no one knows how to get it, the agency will not be precluded from acting until it obtains it. No court has decided what state of the art means in the context of this regulation. The state of the art test should mean the agency must gather information using the best methods known; it would not be sufficient to use general industry practices or particular methods that are actually being used. It is fair to insist that where an action's proponents invoke the state of the art defense, they should come forth with evidence that there are indeed no known means for obtaining the missing information.

23. *See supra* note 19. It is unclear what sort of deliberation or decisionmaking is involved in the weighing. Although the regulation does not expressly mention costs and benefits, the weighing could be construed as a cost benefit analysis. By analogy, the uncertain risks would be the costs and the need for the action would be the benefits against which costs would be balanced.

The analogy should be only loosely followed in practice. A detailed cost benefit analysis is unsuited to taking uncertainty into account. An agency at this stage of EIS development will not know

The worst case analysis regulation has not been before the Supreme Court and was not considered by a circuit court until 1983. In *Sierra Club v. Sigler*,[24] the Fifth Circuit interpreted the regulation to require the Army Corps of Engineers to prepare a worst case analysis on allowing large oil tankers into Galveston Bay. In *Southern Oregon Citizens Against Toxic Sprays v. Watt (SOCATS)*,[25] the Ninth Circuit held that the Bureau of Land Management's (BLM) failure to prepare such a worst case analysis for its herbicide spraying program in parts of Oregon was grounds for enjoining the spraying. In *Save Our Ecosystems v. Clark (SOE)*,[26] the Ninth Circuit extended the *SOCATS* ban on herbicide spraying to Forest Service land in Oregon and also held that section 1502.22(a) required the agencies to gather, or perform original research to produce, additional information.[27] In the more recent case of *Village of False Pass v. Clark*,[28] however, the Ninth Circuit declined to interpret the regulation to require further research or a worst case analysis of the effects of a possible major oil spill at the preliminary stage of offshore oil leasing.[29]

II. ANALYSIS

A. When Must Missing Information Be Gathered?

Under Section 1502.22(a) agencies must gather and include in the EIS information relevant to adverse environmental impacts. The significance of missing information may serve to qualify the duty placed on an agency. If the information is crucial to an informed choice, the agency

what the costs of an action will be and cannot determine whether benefits outweigh them. Yet the general weighing process may still be useful to at least require a preliminary guess on whether the agency should go ahead with further analysis. If, for example, probable costs far exceed any possible benefits, it seems useful for an agency to stop before it goes on to explore the greatest possible costs (the worst case).

The regulation appears to apply to any scientific uncertainty anywhere in an EIS: the phrase "[w]hen an agency is evaluating significant adverse effects on the human environment in an environmental impact statement and there are gaps in relevant information or scientific uncertainty" makes no mention of just where in the EIS it comes into play. 40 C.F.R. § 1502.22 (1984). Subsection (b), which requires a worst case analysis, has in contrast the qualifier "if the agency proceeds." Thus a consistent reading would require the agency to disclose and try to reduce uncertainty in any of the alternatives before it, but it need only produce a worst case analysis for the alternative upon which it chooses to act. The agency may gather the information necessary under section (a), weigh the risks, and then decide not to go ahead with that alternative. It is then free to pick an alternative involving less or no uncertainty or having a greater potential benefit, both for EIS preparation and perhaps final action.

24. 695 F.2d 957 (5th Cir. 1983).
25. 720 F.2d 1475 (9th Cir. 1983).
26. No. 83-3908 (9th Cir. Jan. 27, 1984).
27. *Id.* at 452.
28. 733 F.2d 605 (9th Cir. 1984).
29. *Id.* at 614.

must of course obtain it, but if it is merely of dubious worth, the agency can disregard it. The regulation offers no guidelines beyond requiring that "essential" information be gathered if the costs are not "exorbitant."

The Ninth Circuit is the only circuit to address the issue of how significant missing information must be before it comes within the regulation's ambit. The circuit appears undecided on the issue. The *SOE* court read the regulation to mean that all important information must be gathered.[30] In contrast, the *False Pass* court interpreted it to mean that only essential information was necessary.[31]

Although the regulation uses the word "essential,"[32] that term should be construed generously. As the *SOE* court suggested, agencies should gather not only information that is indispensible to a decision, but also information that is either significant or important.[33] Only unimportant or irrelevant information should fall outside the requirement.

A broad interpretation of what information is "essential" is necessary to reconcile the subsections of section 1502.22. Under subsection (b)(1), for example, if "essential" information is not known because the costs of getting it would be exorbitant, the agency can proceed without gathering it only by first preparing a worst case analysis.[34] Yet under subsection (b)(2), if "important" information is missing because the means of getting it are unknown, the subsection again requires a worst case analysis.[35] Because the regulation impliedly seeks to make all important information available to the decisionmaker, "important" information unavailable because of exorbitant cost should also mandate a worst case analysis. Subsection (a) should thus be squared with subsection (b), so that agencies gather all available important information.

Reading "essential" to mean "important" throughout the regulation simplifies interpretation and serves the general goal of reducing the scientific uncertainty facing the agency.[36] Retaining a distinction between the terms could render an irrational result. If "essential" means one thing

30. *SOE*, No. 83-3908, slip op. at 446 n.5 (9th Cir. Jan. 27, 1984). The *SOE* court was the first appellate court to consider the issue. It decided that no rational distinction could be drawn between "essential" and "important." It held that information should be gathered if essential, if significant, or if important. *Id.*

31. 733 F.2d at 614. In *False Pass* a different panel of the Ninth Circuit revived the distinction and expressly charged the lower courts with trying to honor it. That panel did not offer any reasons for its departure from the earlier decision, but apparently decided that CEQ meant something when it chose its particular words.

32. *See supra* note 19.

33. *See supra* note 30 and accompanying text.

34. 40 C.F.R. § 1502.22(b)(1) (1984).

35. *Id.* § 1502.22(b)(2).

36. Although no history is available to reveal CEQ's intentions, it must have included § 1502.22 to reduce, or enable agencies to forthrightly deal with, scientific uncertainty. An overall goal implicit in the regulations was to simplify and clarify agency duties in NEPA compliance.

and "important" another, the reason why information is missing could determine the action an agency need take. "Important" but not "essential" information that was exorbitantly expensive to gather would not mandate the production of a worst case analysis, while similar information beyond the state of the art would. Because CEQ has offered no reason for the distinction required by a literal reading,[37] it is fair to suppose that CEQ intended no distinction between "important" and "essential."[38]

Courts should also require agencies to gather important as well as indispensible information because of the difficulty in determining what information is absolutely essential to a decision before the information is gathered. Consensus can be more easily reached on what is important to a decisionmaker concerning possible environmental impacts than on what is essential. For example, a chemical company might argue that data on long-delayed effects on animals of pesticide use was not essential, while environmental groups would counter that information on increased pest infestation due to non-action would also be not essential. Each would more likely concede that all such information is important to the decision. By including all information that opposing groups consider important, the agency shows that it is seriously considering each view.

A narrower interpretation of "essential" would involve the court in a premature consideration of the projected agency decision itself. Determining whether information will be essential to a future agency decision probably would involve the court in more detailed analysis of the opposing views than would determining if the information will be important. By making such a detailed inquiry, the court could become embroiled in the issue of the merits of potential agency action before the agency decides to proceed with such action. Moreover, because court review comes only after an agency decision, few courts are likely to decide that missing information was essential to the agency choice unless they think the agency choice was wrong. Conversely, a court will not remand by labeling "essential" missing information that it thinks in fact supports the decision the agency made.

A broader interpretation of "essential" could lead to different and more predictable results. A reviewing court would not attempt to resolve the issue of what information, out of all the important information

37. The two places CEQ might have provided a reason are its "Forty Most Asked Questions," published in the Federal Register, 46 Fed. Reg. 18,026 (Monday, March 3, 1981), and its now withdrawn "Guidelines," 48 Fed. Reg. 36,486 (1983), discussed *infra* at note 41.

38. The *SOE* court pointed out the anomaly posed by a literal reading and first suggested the substitution of "important." *SOE*, No. 83-3908, slip op. at 446 n.5 (9th Cir. Jan. 27, 1984). The dissent in *False Pass* agreed with that interpretation, 733 F.2d at 617 n.1 (Canby, J., dissenting), but the majority's reading may keep alive the literal approach.

gathered, was essential to the decision. If a court were to remand under the broader reading, its determination that unconsidered data was important would not be as strong an indication that the court believed the agency decision was incorrect. The important missing information could well support the path the agency took even though the agency failed in its duty to gather it. The agency on remand could consider the important information and yet stand firm with its original decision. An agency gathering all important information will not face remand, unlike the agency hoping to encounter a court agreeing with its determination of which information was crucial to its decision.

An argument may be made that too much information will be gathered since agencies and courts may have difficulty in drawing the line between important and unimportant information. That view misses the point, however, that the risk and the danger usually lie along the path of proceeding in the dark, not in too much light. Also, in those cases where gathering too much information itself dangerously delays beneficial agency action, common sense dictates including the risk of delay in deciding whether the missing data is indeed important.

B. What Must the Worst Case Analysis Contain?

Subsection (b) of section 1502.22 requires that if an agency discusses an alternative with persistently uncertain consequences it must prepare a worst case analysis. Only the *SOE* court has considered the adequacy of an actual worst case analysis and it found the analysis inadequate. The court specified as inadequacies of the analysis that it was too short[39] and that it erroneously assumed a no-risk exposure level.[40] Although such specifics are useful both for future reviewing courts and agency analysts as examples of pitfalls to avoid, the full scope of an adequate analysis has yet to be delineated.[41] The *SOE* court did suggest further guidelines, such

39. *SOE*, No. 83-3908, slip op. at 448 (9th Cir. Jan. 27, 1984).

40. *Id.*

41. The court held that the Bureau of Land Management's (BLM) analysis of human health effects after exposure to herbicides was flawed. The BLM's critical mistake was that it assumed no effects would occur at low levels of exposure, an assumption the court found "entirely wrong." *Id.* at 448. The court said that the contents of the BLM's analysis could appear in a proper worst case analysis, but indicated that fuller discussion of herbicide toxicity was required. *Id.* at 448 n.8. The court also said, "The record in *Merrell* [a case consolidated with *SOE*] reveals that it is the *policy* of the BLM to avoid discussion of the toxicity of the herbicides it uses. . . . This policy is clearly impermissible." *Id.* at 449.

The *SOE* court also described in more general terms what future worst case analyses should contain. It made clear that discussion of probabilities should only come after discussion of worst case consequences. *Id.* at 448–49. It endorsed the "range of risks" requirement through analogy to NEPA's range of alternatives in EIS preparation. *Id.* at 448 n.7. Finally, it implicitly rejected tentative guidance from CEQ which would have required the analysis only after foreseeable effects had

as a "spectrum of events" requirement,[42] but those suggestions do not bind future courts.

In assessing the adequacy of a worst case analysis, reviewing courts should be concerned with whether the decisionmaker choosing to take a particular risk was well informed by a scientist or analyst about both the possible consequences of the action and the probabilty of each consequence occurring. The value or cost of various harms, on the other hand, requires a policy determination; for example, is the death of three infants "worse" than wiping out a rare subspecies of bird? And what probability of occurrence can be tolerated? The scientist writing the worst case analysis should not attempt to answer such questions.

The worst case analysis should instead take care to separate the harms from the probabilities of a risk so that an agency decisionmaker has full information. If the worst case analyst screens these two components of each risky agency action from the decisionmaker, the decisionmaker cannot properly judge its severity. In *SOE*, for example, the BLM's worst case analysis failed to indicate the probability of each harm potentially caused by its herbicides.[43] The court properly found that such a failure rendered the analysis wholly inadequate.[44]

Similarly, the analyst should separately consider the many possible consequences of an agency action. For example, in *Sigler* the Fifth Circuit directed the Corps of Engineers to prepare a worst case analysis on allowing tankers in Galveston Bay.[45] In that situation, if an analyst were to tell a decisionmaker that the worst potential consequence was a large oil tanker spill in June when wildlife is most affected, the decisionmaker would not know the underlying relevant facts. No decisionmaker can acquire the full expertise of her staff, but she should be informed about what kind of wildlife might be affected, how much worse a June spill is compared to a July or December one, whether traffic volume or weather makes spills more dangerous at certain times of year, and other relevant

been determined. *Id.* at 448. In August of 1983 CEQ published a proposed Guideline to § 1502.22 establishing a threshold of "reasonably foreseeable impacts or effects" before any worst case analysis need be prepared. 48 Fed. Reg. 36,486 (1983). As the former general counsel for CEQ pointed out, the Guideline was an about-face for CEQ. Yost, *Don't Gut the Worst Case Analysis*, 13 ENVTL. L. REP. (ENVTL. L. INST.) 10,394, 10,395 (Dec. 1983). Since "reasonably foreseeable" implies at least some element of probability, it contradicts the CEQ's earlier interpretation that consequences and probability were to be kept separate. 46 Fed. Reg. 18,026, 18,032 (1981). Also, in *SOE*, the court expressly ruled out foreseeability or probability of any sort as a threshold for requiring the worst case analysis. *SOE*, No. 83-3908, slip op. at 448 (9th Cir. Jan. 27, 1984) ("The agency may not omit the analysis only because it believes the worst case is unlikely.") (quoting *SOCATS*, 720 F.2d at 1479).

42. *SOE*, No. 83-3908, slip op. at 448 n.7 (9th Cir. Jan. 27, 1984).
43. *Id.* at 448–49.
44. *Id.*
45. 695 F.2d at 974–75.

facts concerning possible harms. Only a decisionmaker who understands both consequences and probabilities as fully as possible can make an informed policy choice on whether certain risks are worthwhile.

One way to avoid the possible problem of decisionmaking by the analyst is to mandate that the analysis include a range of worst cases.[46] The analysis should not simply identify the one worst consequence, but several bad consequences. For example, if effect A is catastrophic and has a 1% chance of happening, and effect B is not as bad but has a 10% chance of happening, an analyst may decide B is the "worst case" and not include effect A in the worst case analysis, precluding the decisionmaker from viewing and comparing the various risks.[47] The requirement of addressing a range of bad cases thus puts the policy decision of what really is the "worst case" in the hands of the agency head making the final risk determination of the action.

Requiring agencies to prepare a range of worst cases need not produce unmanageable paperwork. Courts and agencies can limit the range by requiring that the study consider only data and projections potentially important to a decisionmaker. The threshold requirement of a base of information from which to project will keep the range within the scientifically possible.[48] Analyses will probably vary, with agencies wanting a more detailed analysis on the more catastrophic consequences, unless an accurate analysis shows their risks to be extremely low.

C. *The Role Of The Courts*

The courts applying section 1502.22 have uniformly taken a hard look at agency compliance with the regulation,[49] and in most cases courts have

46. CEQ has endorsed the idea that the analysis contain a range of consequences: "In addition to an analysis of a low probability/catastrophic impact event, the worst case analysis should also include a spectrum of events of higher probability but less drastic impact." 46 Fed. Reg. 18,026, 18,032 (March 3, 1981), *cited with approval in SOE*, No. 83-3908, slip op. at 447 (9th Cir. Jan. 27, 1984).

47. To speculate on the facts of *SOE*, one might imagine that the herbicides had a 1% chance of causing a birth defect in one child and a 10% chance of causing birth defects in the local deer herd. Which eventuality is the "worst" case is not for the statistician or scientist alone to decide.

48. There must be a body of data from which a certain pessimistic projection reasonably flows A baseless hunch that some day scientists will prove the toxicity of plywood made from fertilized trees would not be sufficient support for a worst case analysis, and is unlike the prediction implicit in *Sigler* that since large oil spills have happened before, they could happen again. The *Sigler* court expressed this threshold requirement by saying that "[t]here must, of course, be a base of information upon which to project past these [state of the art] limits." 695 F.2d at 975. There the possibility of a large oil spill was grounded in some credible base of information. *Id.*

49. Each of the four appellate decisons begins with a presumption of scrutiny, not of deference. *False Pass*, 733 F.2d at 613; *SOE*, No. 83-3908, slip op. at 446 (9th Cir. Jan. 27, 1984); *SOCATS*, 720 F.2d at 1479; *Sigler*, 695 F.2d at 967–68.

found deficiencies and ordered corrective action.[50] Continued strict scrutiny by courts comports with a current theory of agency decisionmaking, furthers NEPA's goal of better decisionmaking, facilitates court review under the Administrative Procedure Act (APA), and provides greater fairness to those potentially affected by agency action.

1. Improved Agency Decisionmaking

Courts traditionally have deferred to agency decisions on the basis of two theories of agency decisionmaking. Courts may see agencies either as administrative arms of government run by neutral or non-political experts, or as mini legislatures, resolving problems through accord and compromise among competing interests.[51] A more recent theory of agency decisionmaking contends that agencies are not necessarily run by experts, nor do their decisions represent an amicable accord among competing interests; rather they are merely "muddling through" and deserve the strict scrutiny they get.[52] The BLM and Forest Service decisions to proceed with herbicide spraying, for example, reflected no special scientific expertise on the health effects of herbicides; in fact the agencies admitted having little or no ability to conduct research on the matter themselves.[53] There was also no evidence of the agency fashioning a compromise between the divergent views of the timber industry and environmentalists.

Agencies may not only muddle along, but may also keep their muddling quiet. Agencies have been reluctant to do worst case analyses.[54] Agencies charged with management functions will be reluctant to

50. The exception was *False Pass*, where the court decided to wait for later stages of oil lease development before deciding the merits of requiring a worst case analysis. 733 F.2d at 615–16.

51. Rodgers, *Judicial Review of Risk Assessments: The Role of Decision Theory in Unscrambling the Benzene Decision*, 11 ENVT'L L. 301, 309–10 (1981).

52. *Id.* at 311–12.

53. *SOE*, No. 83-3908, slip op. at 448 (9th Cir. Jan. 27, 1984). Also, the court precluded the agency in *SOE* from relying on Environmental Protection Agency registration data for the safety of herbicide use. The court's reasons included: (1) registration of the herbicides used was only "conditional," meaning that less than complete data exists, (2) registration involves a "cost benefit" analysis, (3) registration does not reflect a conclusion that a herbicide is safe under any conditions, and (4) each agency has an independant duty under NEPA to assess the safety of the herbicides it uses. *Id.* at 451.

54. Council on Environmental Quality, Talking Points on CEQ's Oversight of Agency Compliance with the NEPA Regulations (1980), *quoted in* Liebsman, *The Council on Environmental Quality's Regulations to Implement the National Environmental Policy Act—Will They Further NEPA's Substantive Mandate?* 10 ENVTL. L. REP. (ENVTL. L. INST.) 50,039, 50,048 n.115, 50,049 (1980). A study of 242 draft EIS's and 88 records of decision led CEQ to conclude that EIS's rarely address the question of incomplete and unavailable information as required by § 1502.22. *Id.* at 50,049.

disclose uncertainty and risk.[55] Thus a "muddling" agency's decision not to gather more information, disclose uncertainty, or prepare a worst case analysis should not be given much deference by the courts, but rather scrutinized with the hardest of looks.

Agency recalcitrance or lack of good faith need not exist, however, to justify strict scrutiny by the courts. Scientific uncertainty and the attendant risks are justification enough for strict scrutiny where the procedures under section 1502.22 have been followed. The regulation is new to both agencies and courts, and both have a duty to comply with its spirit while interpreting its letter.

2. *Fulfilling the Purposes of NEPA*

Section 1502.22 as a whole adds bite to NEPA's provisions on agency decisionmaking. Before its adoption, NEPA's requirement for reasoned decisionmaking[56] often led, in the face of scientific uncertainty, to a "soft glance" by the courts at agency choice.[57] Section 1502.22 does not mandate particular choices, and does not require closer review of agency decisions. By setting out more detailed procedural requirements, however, it invites the courts to take a harder look at what agencies do under conditions of uncertainty. This scrutiny will not only affect the fairness of the process by which agency choices are made, but ultimately may impose

55. Agency decisionmakers who have observed no serious health effects from herbicides and who may be subconsciously biased towards the timber industry's demands for herbicide use probably cannot be relied on to come forward with pessimistic predictions. Strict court review may be needed to overcome such reluctance. A willingness to undertake that review is illustrated by one federal judge who responded to agency recalcitrance in completing the worst case analysis he ordered by saying in open court, "[t]hese officials will spend their spring in jail—in jail—if they do not stop [spraying]." Herbicide spraying was enjoined on all national forest land in Oregon and Washington and on all BLM land in Oregon (some 39 million acres altogether) until the worst case analysis was finished. Seattle Post-Intelligencer, A-1, Col. 5, March 2, 1984. The threat of such sanctions should help overcome reluctance to divulge pessimistic projections.

56. *See supra* note 21.

57. A good example is Ethyl Corp. v. Environmental Protection Agency, 541 F.2d 1, 28 (D.C. Cir. 1976), *cert. denied sub nom.* E.I. Dupont de Nemours & Co. v. Environmental Protection Agency, 426 U.S. 941 (1977). Because uncertainty abounded, an agency choice on reductions of lead content in gasoline was given deference. *But compare* Scientists Institute for Public Information, Inc. v. Atomic Energy Commission, 481 F.2d 1079, 1092 (D.C. Cir. 1973) ("Reasonable forecasting and speculation is thus implicit in NEPA, and we must reject any attempt by agencies to shirk their responsibilities under NEPA by labeling any and all discussion of future environmental effects as 'crystal ball inquiry.'").

Deference may be more appropriate to an agency charged with regulating hazards, as EPA was in *Ethyl*. The danger already exists, and agency action is intended to mitigate it. In contrast, the Forest Service in *SOE*, the BLM in *SOCATS*, or the Army Corps of Engineers in *Sigler* had no particular mandate to determine "safe" levels of risk.

substantive constraints on agency choices that may pose risks of great environmental harm.[58]

The information gathering requirement of section 1502.22 exists independent from the worst case analysis and should be strictly enforced by courts to promote informed decisionmaking. A requirement that agencies gather available information when the cost of doing so is not exorbitant is basic to the continued viability of NEPA itself.[59] The regulation merely clarifies what courts had previously recognized as a central mandate of the Act. The gathering of important missing information changes the context of choice to one of greater certainty and rationality.

Out of that context better decisions should emerge.[60] "Better" should mean, under the reading suggested by NEPA's purpose statement in section 101, more environmentally sensitive.[61] Before adoption of its regulations, CEQ was concerned that agencies were shirking their duties to the environment even as they prepared adequate-looking EIS's.[62] The new regulations were designed to remedy this situation and "tie the process to the heart of the Act . . . by imposing requirements to articulate the decision and affirmatively condition and monitor agency actions on environmental grounds."[63]

Disclosure of uncertainty and the publication of a worst case analysis will make agencies more conservative in choosing to take risky actions. The worst case analysis is fairly specific, will become quite conspicuous, and is by definition pessimistic. This officially authorized horror story is the stuff front page copy is made of, and an agency would probably rather not be subjected to such publicity.[64] Reluctance to proceed, coupled with the courts' enforcement of the regulations, will make agencies more

58. The introductory and explanatory section of CEQ's regulations states:

> Ultimately, of course, it is not better documents but better decisions that count. NEPA's purpose is not to generate paperwork—even excellent paperwork—but to foster excellent action. The NEPA process is intended to help public officials make decisions that are based on understanding of environmental consequences, and take actions that protect, restore and enhance the environment. These regulations provide the direction to achieve this purpose.

40 C.F.R. § 1500.1 (1983).

59. A beneficial by-product is that identification of what is important but unknown may be a positive contribution to the advancement of science that is not likely to be made by concentrating on "reductionist" approaches of pursuing knowledge for its own sake. L. CALDWELL, SCIENCE AND THE NATIONAL ENVIRONMENTAL POLICY ACT 105 (1982).

60. *See supra* note 58.

61. *See supra* note 1.

62. Liebsman, *supra* note 54, at 50,051.

63. *Id.*

64. As one author circumspectly noted, "agencies may be less likely to take risks when the possible adverse effects of their action become part of a reviewable public record." Note, *supra* note 4, at 386. Ironically it is the failure to prepare a worst case analysis that has focused the spotlight on agencies so far. *See supra* note 54.

conservative in their decisions or more considerate of alternatives involving less uncertainty.

In cases where the courts have strictly scrutinized agency compliance with the regulations, the practical effect has been to halt agency action. For example, in *SOCATS* and *SOE* the agencies explained their decision to proceed by emphasizing the low probability of cancer incidence; but the courts, taking a hard look, did not agree. In *SOCATS* the court held that the "possiblity that the safe level of dosage for herbicides is low or even nonexistent creates a possibility" of effects that must be addressed by a worst case analysis.[65] In *SOE*, the court was not deferential to the worst case analysis prepared by the BLM. It criticized the analysis prepared by the BLM as having proceeded from a misguided assumption that at some dosage level the herbicides were safe.[66] Yet since uncertainty existed, a pessimistic or worst case view would be that the level of exposure was not safe, and that use would cause cancer and kill animals and people.[67] The practical effect of the deficiency in the worst case analysis has been to halt herbicide spraying by the agencies in the two northwest states.[68]

A hard look review of agency compliance need not halt agency action. An agency that adheres to the regulations and prepares a thorough worst case analysis is free to take any non-arbitrary, non-capricious course of action. Strict review, however, ensures that agencies do not take shortcuts in the airing of potential dangers. If the agency action is not halted pending such disclosures, it could have irreversible environmental impacts and render court review a post facto exercise in futility.

65. 720 F.2d at 1479.

66. No. 83-3908, slip op. at 448 (9th Cir. Jan. 27, 1984).

67. It is unclear just how low the risk of cancer was. An argument may be made that at infinitely low probabilities risk becomes, in effect, inconsequential. Before dismissing such risks out of hand, it is best to remember that policy judgments are being made, and people are being affected. The force of non-scientific experience should be a value weighed in good decisionmaking. That value is well expressed in Kellman, *Anxiety over the TMI Accident: An Essay on the Limits of Inquiry under NEPA*, 51 GEO. WASH. L. REV. 219, 247 (1983) ("In March 1979, an event with a statistically insignificant probability of occurring did occur. History is full of instances where the improbable occurred. Arguably, law should be as responsive to the lessons of history as to the calculations of technical experts.").

68. *See supra* note 55. Conservatism in the field of toxic chemicals accords perfectly with NEPA mandates, and courts should not be reluctant to acknowledge it. The low dose, long term cancer risk posed by BLM and Forest Service spraying, for example, is precisely the sort of risk least well known about in scientific circles. Current state of the art scientific analysis is unable to predict safe threshold doses for any carcinogen. As one highly reputable study found:

> The self-replicating nature of cancer, the multiplicity of causative factors to which individuals can be exposed, the additive and possibly synergistic combination of effects, and the wide range of individual susceptibilities work together in making it currently unreliable to predict a threshold below which human population exposure to a carcinogen has no effect on cancer risk.

Scientific Causes for Identification of Potential Carcinogens and Estimation of Risks, 63 J. NTL CANCER SOC'Y, 253, 264 (July 1979).

3. Review Under the Administrative Procedure Act

A hard look at an agency's interpretation of section 1502.22 will promote a more complete record from which courts can properly judge agency choice under the APA.[69] Agencies must comply with CEQ's regulations, and reviewing courts have unwritten discretion to apply a hard or soft look in deciding whether an agency has complied.[70] This Comment argues for a hard look at agency interpretation so that the purposes of the regulation are fulfilled.

Nowhere do CEQ's regulations provide for judicial review of the final agency choice. The non-adjudicative agencies' decisions are presumed to be a policy choice within the agencies' and not the courts' authority. The APA, however, authorizes federal courts to review substantive decisions, including environmental decisions, of all federal agencies using an "arbitrary and capricious" test.[71] For example, it may be so foolhardy for an agency to proceed in the face of risks disclosed by information gathering or a worst case analysis that agency action would be deemed "arbitrary and capricious."

Strict review for compliance with the regulations is consistent with "arbitrary and capricious" review of the substantive decision. Strict adherence to the regulations will not allow an agency to hide risks involving scientific uncertainty and may stop an agency from proceeding. On the other hand, if a worst case analysis indicates that the worst consequences are not very significant, it is possible that an agency could shortcut other procedural requirements,[72] and such a choice would not be arbitrary. Enforcing strict adherence to section 1502.22 allows for a more complete record when the decision to proceed is reviewed under the arbitrary and capricious standard.[73]

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69. 5 U.S.C. § 706 (2)(A) (1982).

70. *See* Marcel, *The Role of the Courts in a Legislative And Administrative Legal System—The Use of Hard Look Review in Federal Environmental Litigation*, 62 OR. L. REV. 403 (1983) (discussing review under the APA, 5 U.S.C. § 706(2)(A) (1982)).

71. Marcel, *supra* note 70, at 406.

72. Thus mitigation (required under 40 C.F.R. §§ 1502.14(f) and 1502.16(h)) may not be necessary where consequences are insignificant. Also, the list of "reasonable" alternatives (required under 40 C.F.R. §§ 1502.14(a–c) and 1502.16(d–f)) may shrink because the more beneficial, harmless, and cost-effective one alternative becomes, the less reasonable become alternatives that are less beneficial, possibly more harmful, and less cost-effective.

73. 40 C.F.R. § 1505.2 (1983), requires a "record of decision" of each agency producing EIS's, to facilitate review. An agency must "[i]dentify all alternatives considered by the agency in reaching its decision, specifying the alternative or alternatives which were considered to be environmentally preferable." *Id.* It must also "[s]tate whether all practicable means to avoid or minimize environmental harm from the alternative selected have been adopted, and if not, why they were not. A monitoring and enforcement program shall be adopted and summarized where applicable for any mitigation." *Id.*

4. Fairness to Those Potentially Affected

Another purpose that strict scrutiny of CEQ's regulation serves is to protect those potentially hurt by agency action. Through public disclosure people and interests that could be adversely affected gain a greater awareness of what risks the action may impose on them. Improved decisionmaking should also increase their chances of being safeguarded from dangerous choices. Finally, they may gain a sense of fairness and respect for the decision by participating, in at least limited ways, in the decisionmaking process itself.[74]

A hard look at agency action involving uncertainty will help enforce the courts' duty to be fair. Deference to an agency that does not know what might happen and has no good reason to otherwise inform people of its lack of knowledge would be fundamentally unfair.[75] The extra process given by more diligent information gathering, more open disclosure of uncertainty, and frank admission of possible dangers is due those who may be hurt by the uncertain catastrophe. Courts can and should temper agencies' concern for social utility and getting things done with a hard look to protect the more personal concerns and rights of those potentially affected.

III. CONCLUSION

CEQ's regulation on scientific uncertainty imposes duties on agencies that were not explicitly imposed by NEPA. Agencies must gather relevant missing information, and they should gather it whenever it is important to the decision. If the information is unavailable, the agency must prepare a worst case analysis. That analysis should keep possible harms and their probabilities separate as well as address a range of pessimistic projections. Because agency response to the problems posed by scientific uncertainty is often not within agency expertise, and the dangers of improper response are great, court review of compliance with the CEQ regulation should be strict.

Mark Reeve

74. At a minimum, the public may participate in decisionmaking during a 45-day written comment period and during agency hearings. *SOE*, slip op. at 450; 40 C.F.R. § 1506.10(c) (1983).

75. Rodgers, *Building Theories of Judicial Review in Natural Resources Law*, 53 COLO. L. REV. 213, 226 (1982).